CLAIMS

1. A method of producing an emitter array, comprising:

forming an initial set of emitters that is associated with a first quantum well characteristic on a semiconductor substrate;

etching away a subset of the initial set of emitters from the semiconductor substrate thereby exposing a portion of said semiconductor substrate; and

forming, on the portion of the semiconductor substrate, at least one subsequent set of emitters that is associated with a second quantum well characteristic that is different than said first quantum well characteristic.

2. The method of claim 1 wherein said at least one subsequent set of emitters possesses a center wavelength that is different from a center wavelength of said initial set of emitters.

3. The method of claim 1 wherein said first quantum well characteristic is quantum well thickness of a first value and said second quantum well characteristic is quantum well thickness of a second value.

4. The method of claim 1 wherein at least one of said initial set of emitters and said at least one subsequent set of emitters comprises emitters with quantum wells that possess a thickness that varies as a function of position.

5. The method of claim 1 wherein at least one of said initial set of emitters and said at least one subsequent set of emitters comprises emitters with multiple quantum wells with each of said multiple quantum wells possessing a different center wavelength.

6. The method of claim 1 wherein said first quantum well characteristic is a first material composition and said second quantum well characteristic is a second material composition.

7. The method of claim 1 further comprising:

fabricating an incoherently beam combined (IBC) laser utilizing said emitter array.

8. The method of claim 7 further comprising:
operating said IBC laser as a Raman pump.

9. The method of claim 8 wherein said Raman pump is tuned to stimulate Raman gain over at least one band in a wavelength range selected from the list consisting of: 1430 to 1530 nm; 1530 to 1565 nm; 1570 to 1610 nm; and 1615 to 1660 nm.

10. The method of claim 1 wherein said forming an initial set of emitters comprises:
growing waveguide layers, cladding layers, and a gain region.

11. An emitter array, comprising:

a first plurality of emitters with each emitter of said first plurality of emitters being substantially identical and possessing a first quantum well characteristic;

a second plurality of emitters with each emitter of said second plurality of emitters being substantially identical and possessing a second quantum well characteristic that is different that said first quantum well characteristic; and

a monolithic substrate, wherein said first plurality of emitters and said second plurality of emitters are coupled to said monolithic substrate by being formed on said monolithic substrate.

12. The emitter array of claim 11 wherein said first quantum well characteristic is a quantum well thickness of a first value and said second quantum well characteristic is a quantum well thickness of a second value.

13. The emitter array of claim 11 wherein said first quantum well characteristic is a first material composition and said second quantum well characteristic is a second material composition.

14. The emitter array of claim 11 wherein said first plurality of emitters possesses a center wavelength that is different from a center wavelength of said second plurality of emitters.

15. The emitter array of claim 11 wherein at least one of said first plurality of emitters and said second plurality of emitters comprises emitters with quantum wells that possess a thickness that varies as a function of position.

16. The emitter array of claim 11 wherein at least one of said first plurality of emitters and said second plurality of emitters comprises emitters that include multiple quantum wells with each of said multiple quantum wells having a different center wavelength.

17. The emitter array of claim 11 wherein said emitter array possesses an intrinsic gain bandwidth of at least 40 nm.

18. A system for providing a Raman pump, comprising:

an emitter array including:

a first plurality of emitters with each emitter of said first plurality of emitters being substantially identical and possessing a first quantum well characteristic;

a second plurality of emitters with each emitter of said second plurality of emitters being substantially identical and possessing a second quantum well characteristic that is different that said first quantum well characteristic; and

a monolithic substrate, wherein said first plurality of emitters and said second plurality of emitters are coupled to said monolithic substrate by being formed on said monolithic substrate;

a partially reflective component that provides feedback to said emitter array; and

a diffraction grating that is operable to diffract output beams from said emitter array toward said partially reflective component and is operable to angularly separate feedback from said partially reflective component.

19. The system of claim 18 wherein said first plurality of emitters possesses a center wavelength that is different from a center wavelength of said second plurality of emitters.

20. The system of claim 18 wherein said first quantum well characteristic is quantum well thickness of a first value and said second quantum well characteristic is quantum well thickness of a second value.

21. The system of claim 18 wherein at least one of first plurality of emitters and said second plurality of emitters comprises emitters with quantum wells that possess a thickness that varies as a function of position.

22. The system of claim 18 wherein at least one of first plurality of emitters and said second plurality of emitters comprises emitters with multiple quantum wells with each of said multiple quantum wells having a different center wavelength.

23. The system of claim 18 wherein said first quantum well characteristic is a first material composition and said second quantum well characteristic is a second material composition.

24. The system of claim 18 further comprising:

an optical fiber that is operable to receive incoherently combined beams from said first plurality of emitters and said second plurality of emitters.

25. The system of claim 24 wherein said incoherently combined beams from said first plurality of emitters and said second plurality of emitters stimulates Raman scattering of telecommunication signals in said optical fiber.

26. The system of claim 25 wherein Raman gain is stimulated in said optical fiber over a wavelength range selected from the list consisting of: 1430 to 1530 nm;1530 to 1565 nm; 1570 to 1610 nm; and 1615 to 1660 nm.

27. The system of claim 25 wherein Raman gain is stimulated in said optical fiber over a bandwidth of at least 40 nm.